



ZIMBABWE EZEKIEL GUTI UNIVERSITY

FACULTY OF, SCIENCE, TECHNOLOGY, AGRIC AND FOOD SYSTEMS DEVELOPMENT

DEPARTMENT OF DIGITAL TECHNOLOGY AND INFORMATION SYSTEMS

EXAMINATION PAPER

COURSE CODE : BIS 412
COURSE TITLE : Artificial Intelligence
SPECIAL REQUIREMENTS : None
DURATION : 3 Hours
LEVEL : 4.1
DATE : 10 JUN 2026

INSTRUCTIONS TO CANDIDATES:

1. Answer all questions in **SECTION A** and any 3 Questions from **SECTION B**.
2. The total Marks for the examination is 100.
3. The marks allocation for each question are indicated in square brackets [].

SECTION A
ANSWER ALL QUESTIONS

QUESTION 1

- a. Describe generic categories of Expert System applications [10 marks]
- b. Discuss the fundamental roles of the following in building expert systems
 - i. Expert
 - ii. Knowledge engineer
 - iii. User [6 marks]

QUESTION 2

- a. Discuss the advantages and disadvantages of using expert systems. [10 marks]
- b. Describe
 - i. some of the limitations of Expert system [3 marks]
 - ii. the success factors of Expert system [3 marks]
- c. Explain the difference between inductive and deductive reasoning. Use examples to illustrate your answer. [8 marks]

SECTION B
ANSWER ANY THREE QUESTIONS

QUESTION 3

- a. Provide and explain Expert System (ES) architecture illustrating role of every component. [10 marks]
- b. Discuss the problems faced in Knowledge elicitation. State the ways to correct it? [6 marks]
- c. Briefly describe the breadth-first and the depth-first search for trees. [4 marks]

QUESTION 4

There are increasing numbers of expert and knowledge based systems being developed which raises concerns for possible societal risks.

Discuss the ethical issues and challenges raised by different types of expert and knowledge based systems and their impact on people and society using relevant examples to illustrate your answers.

[20 marks]

QUESTION 5

- a. Differentiate between verification, validation and evaluation of expert systems. [10 marks]
- b. Give a detailed description of the different knowledge representation techniques with a practical example of each [10 marks]

Question 6

- a. Given the statements below:

A trout is a fish

A fish has gills

A fish has fins

Fish is food

Fish is animal

An apple is a fruit

Fruit has a stem

Fruit is food

Fruit is vegetable

An animal is a living thing

A vegetable is a living thing

Design a semantic network from below sentences

[10 marks]

- b. A ready-made Expert System is selling for \$5,000. Developing one will cost you \$50,000. A ready-made suit will cost you \$100, and a tailored one will cost you \$500. Develop an analogy between the two situations and describe the markets for the ready-made and customized products. Why does a ready-made Expert System costs only 1 percent of the cost of developing one, while a ready-made suit costs 20 percent of the cost of a tailored one?

[10 marks]

End of Paper

0/5 Am